



TITLE:

# <Original Articles>Study on Cases with Primary Traumatic Oculomotor Nerve Palsy

AUTHOR(S):

OTSUKA, SHIN-ICHI; YAMAZOE, NAOHIRO; KIKUTA, KEN-ICHIRO; KUNIEDA, TAKEHARU

---

CITATION:

OTSUKA, SHIN-ICHI ...[et al]. <Original Articles>Study on Cases with Primary Traumatic Oculomotor Nerve Palsy. 日本外科宝函 1994, 63(3): 87-90

ISSUE DATE:

1994-05-01

URL:

<http://hdl.handle.net/2433/203632>

RIGHT:

---

原 著

---

## Study on Cases with Primary Traumatic Oculomotor Nerve Palsy

SHIN-ICHI OTSUKA, NAOHIRO YAMAZOE, KEN-ICHIRO KIKUTA and TAKEHARU KUNIEDA

Department of Neurosurgery, Otsu Red-Cross Hospital

Received for Publication, Jan. 12., 1994

### Introduction

Traumatic oculomotor nerve palsy is classified into two types; the primary oculomotor nerve palsy due to direct injury of oculomotor nerve and the secondary one due to transtentorial herniation associated with intracranial hematoma or brain swelling. In this study, we report 13 cases with primary traumatic oculomotor nerve palsy and review some literature.

### Clinical materials and results

In a series of 1052 cases of head trauma at our hospital between January of 1985 and June of 1993, there were 13 cases who presented primary oculomotor nerve palsy caused by head trauma. The incidence was about 1.2%.

Table 1 shows the summary of clinical data in 13 cases. Of the 13 cases 7 were male and 6 were female. Age distribution of 13 cases was from 7 to 83 years old (m.32 years). The cause of injury was traffic accident in all cases. The sites of impact were frontal region in 8 cases, occipital region in 3 cases, temporal region in one case and unknown in one case. The main direction of impact was fronto-occipital in most cases. The level of consciousness on admission was 4 to 14 (m.7) evaluated by Glasgow Coma Scale (GCS). GCS was less than 9 in 9 cases on admission. The level of consciousness was relatively poor on admission but it was improved rapidly in many cases. GCS was improved up to 14 or 15 in 9 cases during 3 days after admission. In other 4 cases, disturbance of consciousness was prolonged but it was improved completely by at least 1.5 months after admission. Motor weakness of extremities was recognized in 5 cases and decerebrate posture was recognized in 2 cases on admission.

On skull X-rays, fracture was present in the occipital region in 2 cases and in the frontal region in one case. The fracture of left lateral wall of orbit was recognized on CT in one case.

CT demonstrated subarachnoid hemorrhage (SAH) in the cisterns around the brain stem such as ambient cistern and quadrigeminal cistern in 2 cases and in the sylvian fissure and cortical sulci in

---

Key words: Head trauma, Oculomotor nerve palsy

索引用語: 頭部外傷, 動眼神経麻痺

Present address: Department of Neurosurgery, Otsu Red-Cross Hospital 1-1-35 Nagara, Otsu City. 520 Japan

**Table 1** Summary of clinical data in 13 cases

|    |                              |                   |         |
|----|------------------------------|-------------------|---------|
| 1  | Age (years)                  | 7-83 (m.32)       |         |
| 2  | Sex                          | male              | 7 cases |
|    |                              | female            | 6 —     |
| 3  | Cause of injury              | traffic accident  |         |
| 4  | Sites of impact              | frontal           | 8 —     |
|    |                              | occipital         | 3 —     |
|    |                              | temporal          | 1 —     |
| 5  | Level of consciousness (GCS) | 4-14 (m.7)        |         |
| 6  | Fracture on skull X-rays     | occital           | 2 —     |
|    |                              | frontal           | 1 —     |
| 7  | CT findings                  | SAH               | 4 —     |
|    |                              | IVH               | 2 —     |
|    |                              | contusion         | 5 —     |
| 8  | MRI findings                 | contusion         | 3 —     |
| 9  | Oculomotor nerve palsy       | complete          | 3 —     |
|    |                              | partial           | 10 —    |
| 10 | Prognosis                    | complete recovery | 10 —    |
|    |                              | partial recovery  | 2 —     |
|    |                              | no change         | 1 —     |

2 cases. Intraventricular hemorrhage (IVH) was recognized in 2 cases. Brain contusion was recognized in the corpus callosum in one case, in the basal ganglia in 2 cases, in the temporal lobe in 2 cases. In 5 cases, no intracranial abnormal findings were detected on CT.

MRI was carried out in 4 cases. In one case, brain contusion was present in the mid brain, left frontal lobe and left temporal lobe. In other two cases, brain contusion was present in the corpus callosum. In one case, no intracranial abnormal findings were detected on MRI.

Oculomotor nerve palsy was complete in 3 cases and partial in 10 cases. Complete recovery of oculomotor nerve palsy was recognized in 10 cases by the end of 6 months after head trauma. In 2 of other cases, ptosis and intraocular palsy were improved completely but extraocular palsy was improved incompletely during 3 and 6 months after head trauma. In the remaining one case, oculomotor nerve palsy was unchanged by the end of 5 months after head trauma.

## Discussion

Traumatic oculomotor nerve palsy was reported in some literature<sup>1-5)</sup>. Memon<sup>1)</sup> reported that there were 60 cases with traumatic oculomotor nerve palsy in all 1100 cases with head trauma and in those 60 cases, 48 cases were secondary oculomotor nerve palsy and 12 cases were primary one. In this study, we reported 13 cases with primary traumatic oculomotor palsy. The incidence was about 1.2% (13 cases in all 1052 cases with head trauma between January of 1985 and June of 1993). The incidence was as same as that Memon reported (about 1.1%; 12 cases in all 1100 cases). The sites of lesion of traumatic oculomotor nerve palsy were suspected to be intramedullary portion, tentorial gap, intracavernous portion and intraorbital portion<sup>2)</sup>. In most cases with shearing injury, it is considered that oculomotor nerve is injured at the site of tentorial gap due to the sudden vertical move-

ment of brain stem caused by the fronto-occipital impact except the direct injury of oculomotor nerve in the orbit<sup>3)</sup>. It was suspected that oculomotor nerve was injured at the tentorial gap in most of our cases. It is said that the prognosis of traumatic oculomotor nerve palsy is not good although the prognosis of oculomotor nerve palsy caused by aneurysm or infection is relatively good<sup>4)</sup>. But Takano<sup>5)</sup> reported that about 85% of cases with primary traumatic oculomotor nerve palsy recovered. As the recovery of injured nerve depends on the extent of the damage of the nerve, the prognosis of oculomotor nerve palsy may be variable case by case. As the rate of complete recovery was 77% in our study, the prognosis of primary traumatic oculomotor nerve palsy seemed to be relatively good.

### Conclusions

1. Thirteen cases with primary traumatic oculomotor palsy were studied.
2. The incidence was 1.2% (13 cases in all 1052 cases with head trauma).
3. The site of lesion was suspected to be the tentorial gap in most cases.
4. The prognosis was relatively good (complete recovery was 77%).

### References

- 1) Memon MY and Paine KWE: Direct injury of the oculomotor nerve in craniocerebral trauma. *J Neurosurg* 35: 461-464, 1971.
- 2) Fujino S, Fukai H, Ueda A, et al: Bilateral direct injury of oculomotor nerve in craniocerebral trauma —Report of a case—. *Neurol Surg* 5: 1065-1069, 1977.
- 3) Nakashima S, Abe M, Tabuchi K, et al: Traumatic bilateral oculomotor nerve palsy; A case report. *Neurol Surg* 20: 505-508, 1992.
- 4) Ohguro H, Takeda M and Nakagawa T: Acquired oculomotor nerve palsy —A review of 74 cases. *Neuro-ophthalmol Jpn* 3: 263-266, 1986.
- 5) Takano S, Miyasaka Y, Yada K, et al: Traumatic primary paralysis of the oculomotor nerve. *Neuro-ophthalmol Jpn* 5: 421-426, 1988.

## 和文抄録

## 一次性外傷性動眼神経麻痺症例の検討

大津赤十字病院 脳神経外科

大塚 信一, 山添 直博, 菊田健一郎, 國枝 武治

頭部外傷による一次性動眼神経麻痺症例13例について検討した。発生頻度は、過去8.5年間に入院した頭部外傷症例1052例中13例 (1.2%)であった。年齢は7歳から83歳 (平均32歳) で、男7例、女6例であった。受傷機転は全例交通外傷で、受傷部位は前頭部8例、後頭部3例、側頭部1例で、1例は不明であった。入院時の意識レベルは、Glasgow Coma Scale で4点から14点 (平均7点) であった。頭蓋単純写で骨折が3

例に認められた。CT では、くも膜下出血が4例、脳室内出血が2例、脳挫傷が5例に認められた。MRI は4例に施行され、3例に脳挫傷が認められた。予後は6カ月の観察期間で、完全回復10例、不完全回復2例、不変1例であった。今回検討した症例では、前後方向の外力により、tentorial gap で動眼神経の損傷をきたした症例が多いと考えられた。予後は比較的良好であった。